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Attaleachernes gen. nov., a new Chernetid genus from palm trees in the Brazilian Pantanal (Pseudoscorpiones: Chernetidae)

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ABSTRACT Contrib. Nat. Hist. 12: 921–930.

The new genus *Attaleachernes* gen. nov. with its type species *thaleri* sp. nov. is described from the Brazilian Pantanal (Mato Grosso, Brazil). It lives apparently on the crown of the palm tree *Attalea phalerata* (Mart.), its biology is unknown. It is a remarkable sexually dimorphic pseudoscorpion, showing phenonological affinities with *Xenochernes* Feio, but it seems also to be quite near to *Zaona* Chamberlin and *Sundochernes* Beier by the presence of 3 flagellar setae, the shape of the spermatheca, the trichobothrial pattern and some other characters.

Introduction

The Pantanal of Mato Grosso (Brazil) is formed in a huge depression by the upper part of the Rio Paraguay and its tributaries, and it represents one of the largest wetlands of the world. During the flood periods (December to March) the flood levels vary from few centimeters to several meters. Terricolous arthropods have to adapt to these extreme conditions to enhance their ability of survival; a bilateral cooperation between the Federal University of Mato Grosso (UFMT) at Cuiaba (Prof. Marinez M. Marquez) and the Max-Planck-Institute for Limnology (MPIL) at Plön, Germany (the late Prof. Dr. Joachim Adis) has been initiated to study this phenomenon. This program concentrates on the northern Pantanal wetland (Adis et al. 2001, Battirola et al. 2006).

The pseudoscorpion fauna of Mato Grosso and the Pantanal is poorly known, only isolated records have been published (e.g. Beier 1932, Mahnert 2001, see also Harvey 1991), but the fauna is probably closely related to that of Paraguay published by Balzan (1890). Those species are under revision by me. The rich collections constituted during the field work in the frame of this recent project include a surprisingly high number of species and genera and

are under current study. In this publication a partial result is given with the description of a new genus and species.

Material and Methods

The specimens were examined under a Nikon microscope, partly under Nomarsky contrast effect, internal structures were studied after clearing with lactic acid and/or KOH-solution. Measurements were made on temporary slide preparations of the appendages which were stored afterwards in alcohol and in microvials.

Descriptions

Attaleachernes gen. nov.

Type species by monotypy: *Attaleachernes thaleri* sp. nov.
Terra typica: Brazil, Mato Grosso

Diagnosis: Differs from all chernetid genera by the following combination of characters: All trichobothria except *et/it* in basal half of fixed chelal finger; interior accessory teeth absent on movable finger and reduced to one on fixed finger; hand cylindrical, not much wider than pedicel; female with a paired spermatheca with lemon-shaped terminal enlargements.

Description: Genus of the family Chernetidae; all parts weakly sclerotized, general colour whitish yellow; carapace with two indistinct eye spots, two transversal furrows which are distinct only laterally; a central coloured spot ("groove"); setae of carapace and tergites clearly clavate and dentate, those of coxae and sternites acute and slender; cheliceral palm with 5–6 setae, one or two basal ones apically finely dentate, rallum of three blades, galea stout, with 5–6 subapic/apical branches in both sexes. Pedipalps: Sexual dimorphism pronounced, the pedipalps of males are much more slender than those of females even if highly variable; setae clavate and dentate, the lateral ones on patella and hand more slender than those of inner side; hand of chela not much wider than pedicel; trichobothria: 8 trichobothria on fixed, 4 on movable finger, on fixed finger all trichobothria in basal half of finger, only *et/it* in distal half near finger tip, *isb* and *st* nearly on same level, distinctly distad *est* which is nearer to *ist* than to *isb*; number of accessory teeth reduced to none/one on internal side of movable/fixed finger; spermatheca consisting of two

long tubes with lemon-like apical enlargements; leg IV slender, femur+patella at least 4.7 times larger than deep, tarsus IV without a long tactile seta, a short subapical "pseudotactile" seta present; claws smooth, undivided, clearly longer than undivided arolium; subterminal seta smooth, curved.

Affinities: Within the family Chernetidae the number of blades in the cheliceral rallum seems to represent an important taxonomic character, but its phylogenetic significance is under discussion. Within the group of genera showing similar characters (three setae in cheliceral rallum, no tactile seta on tarsus IV, all but two trichobothria grouped at base of fixed chelal finger), it is distinct from *Parachernes* CHAMBERLIN by the shape of female spermatheca, the trichobotrial pattern (*it* near *et* and near finger tip) and by the presence of a short pseudotactile seta on tarsus IV in subapical position; from *Zaona* CHAMBERLIN the new genus might be separated by the shape of the spermatheca and the trichobothrial pattern (*ist* clearly distad *est* and in middle of fixed finger and clearly proximal of *t* of the movable finger). It shares with *Xenochernes* FEIO (Pirapora, Minas Gerais, "em casca de figueira brava" = *Datura stramonium* (Solanaceae) or *Ficus garanitica* (Moraceae)?) the trichobothrial pattern (*isb* (= formerly *ist*) at level of *st*) and the shape of palpal chela, but differs from it by the basal position of trichobothrium *est,* by the morphology of spermatheca (tubes much longer, the enlargement smaller), the shape of galea, the chaetotaxy of the female genital opercle (presenting a central patch of small, short setae), by the absence of clavate setae (*sbs* and *bs*) and the discontinuous position of *ls* and *is* on the cheliceral palm and by its much more slender appendages (pedipalps and legs) (Feio 1945, Harvey 1994). The Asian genus *Sundochernes* BEIER (described from Sumatra) possesses a similar trichobothrial pattern, a sexual dimorphism concerning pedipalps, but differs by the more distal position of trichobothria (*isb/est* between *it* and *ib/ist)* and the shape of the chela; spermateca of *Sundochernes* (2 thickened tubes with rounded terminal bulbs: Harvey & Volschenk (2007) seem to be similar to those of the new genus, but in the absence of drawings evaluation of differences/similarities is difficult.

Fig. 1. Habitus of *Attaleachernes thaleri* gen. nov., sp. nov. (photo Berit Hansen, Plön).

***Attaleachernes thaleri* sp. nov.** (Figs. 1–11)

Holotype ♀: Brazil, Mato Grosso, Pirizal near Poconé, Fazenda Retiro Novo, 56° 18' W, 16° 23' S, sur *Attalea phalerata* (MART.) (Arecaceae), leg. Leandro L. Battirola.
Paratypes: 8 ♂, 9 ♀, 3 trito-, 7 deuto-, 18 protonymphs. Same data as holotype.

Holotype and paratypes are deposited in the Museu de Zoologia of the University of Sao Paulo (Brazil). Some paratypes are also housed in the Muséum d'histoire naturelle, Geneva (Switzerland) (2 ♂, 3 ♀, 1 trito-, 1 deuto-, 1 protonymph), in the Instituto de Biociencias of the University of Cuiaba (Brazil) and the Max-Planck-Institute, Tropical Ecology Working Group, Plön (Germany).

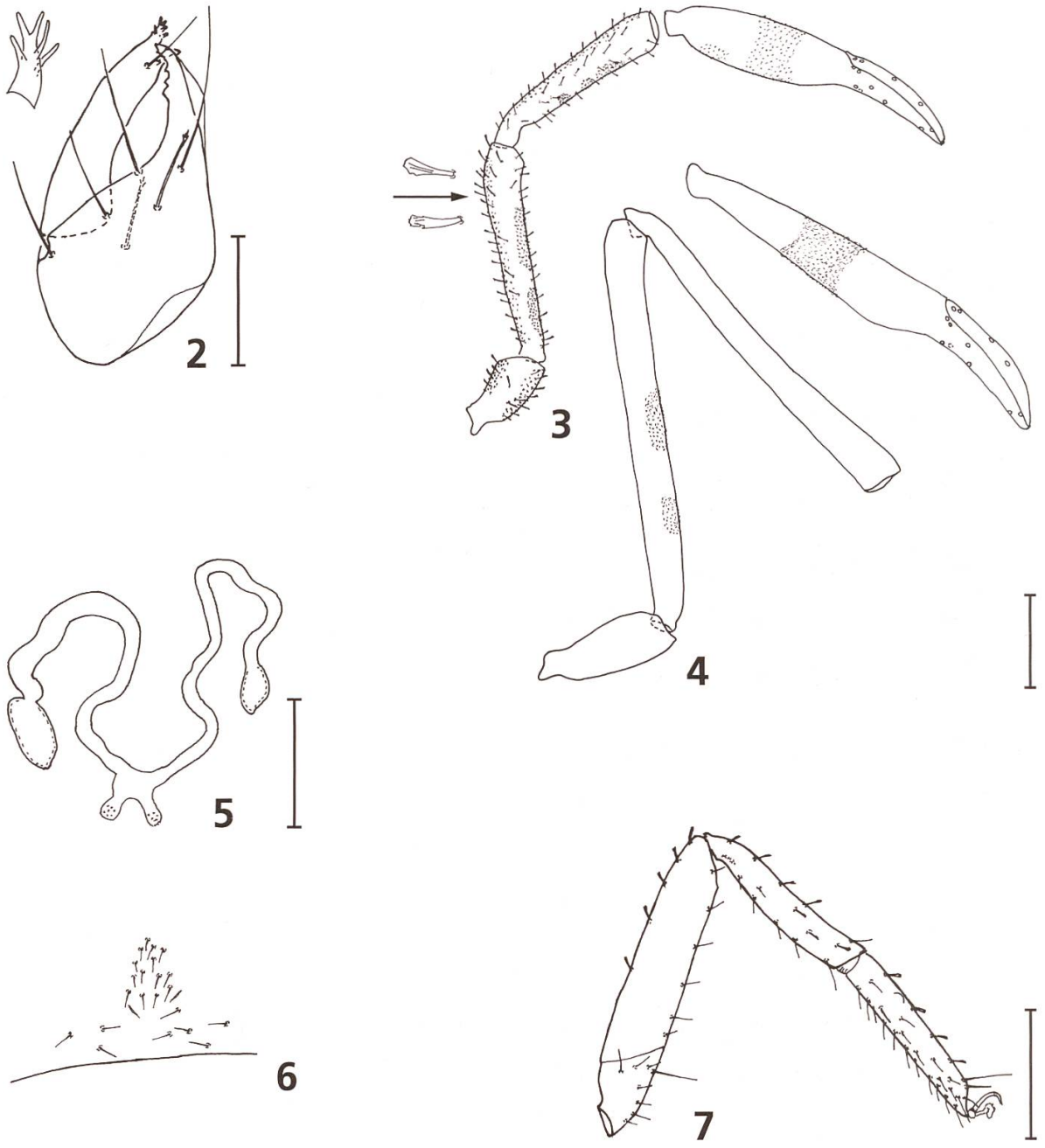
Derivatio nominis: Dedicated to the memory of Konrad Thaler who encouraged me strongly during my first steps into pseudoscorpion taxonomy. The unknown biology of this species and its uncertain systematic affinities are the reasons of this dedication: Konrad Thaler patiently worked during years and years on the one or the other badly known species to discover its biology, habitat and systematic position.

Description: General colouration yellowish; carapace with a median brownish mark ("groove")(slightly hour-glass-shaped), the lateral sides of the median transverse furrow darker (more strongly granulate); tergite I with a median mark, following half-tergites each with a central brownish mark, the lateral margins slightly darker; pedipalps: femur on inner side with two darker zones (stronger sclerotization with clearly more numerous and denser granules), patella on inner margin with three small darker zones, central part of chelal hand darker, with unpigmented zones at its base and at finger base (zones nearly smooth). Carapace and tergites granulate, the last ones ctenoid scaly sculptured, pedipalps strongly granulate, granula pointed. Vestitural setae clavate and dentate, on lateral side of palpal patella and hand dentate and more slender.

Carapace: 0.9–1.0 times longer than broad, two indistinct eye-spots present, two transverse furrows present, both distinct only laterally, subbasal furrow clearly nearer to straight posterior margin than to median furrow; 6 setae at anterior, 10–16 setae (some in discal position) at posterior margin; tergites I and XI undivided, the others indistinctly divided, I–IV with 5–6 setae, the following ones with 7–8 setae on posterior margin, IV–V with also one anterior lateral and median setae, VI–X with 1 or 2 lateral discal setae, XI 13–15 setae, all clavate, without tactile setae. Lobe of pedipalpal coxa with 3 marginal (one microseta) and one discal setae, pedipalpal coxa distinctly granulate on lateral side, about 20 setae, coxa I 10–13 setae, II 10–13, III 12–17, IV about 35; genital operculum of male about 50 setae in two or three semicircular series(the inner ones longer), that of female with median patch of 16 short and 3/3 longer submarginal setae; chaetotaxy of half sternites:III 2-4+1-2, IV 2-4+1, following ones with 5–8 marginal setae, XI 7–10 (2 lateral tactile setae, 2 median discal setae), anal cone 2+2 acute setae.

Chelicera (Fig. 2): Palm with 5–6 setae, one or two (*bs*' and *bs*") apically dentate, fixed finger with 3 larger and 2–3 tiny subapical teeth, movable finger with two-pointed subapical lobe; subgaleal seta smooth, reaching beyond tip of galea; galea stout, in both sexes with 5–6 subapical/apical branches, rallum of 3 blades (the anterior one with 3–5 teeth), serrula exterior with 18–22 blades.

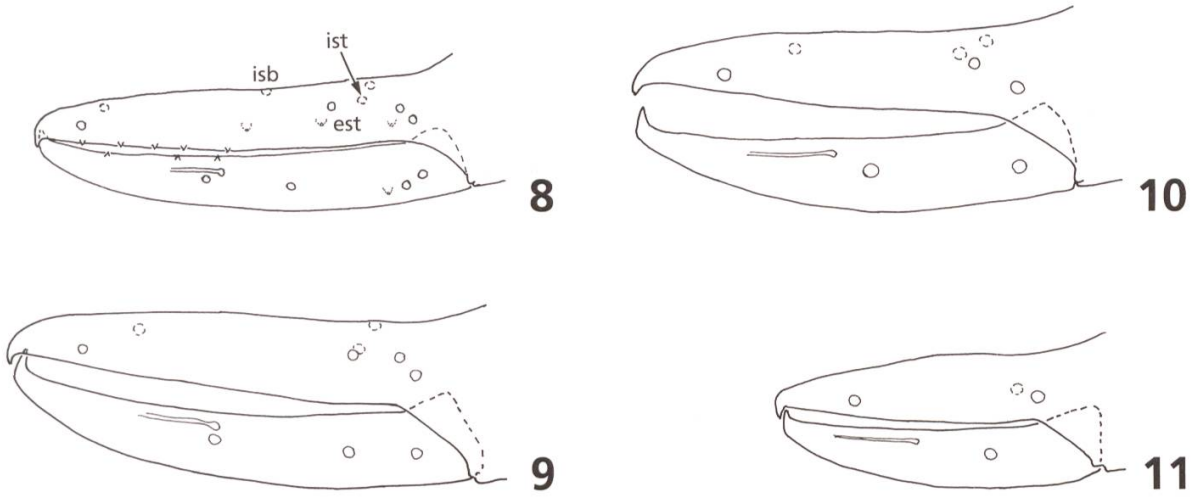
Pedipalps (Figs. 3–4): Male: Trochanter parallel-sided, 2.5–2.9 times longer than broad, dorsal hump indistinct, femur slightly club-shaped, 8.5–10.1 times longer than broad and 1.03–1.09 times longer than patella, patella 7.0–8.6 times longer than broad, hand not much broader than pedicel, parallel-sided, with pedicel 4.6–5.2 times longer than broad, 1.5–1.9 times longer than finger, chela with pedicel 7.3–7.8 times, without pedicel 6.8–7.5 times longer than broad. Female: trochanter slightly tulip-shaped, dorsal hump broad and



Figs. 2–7. – 2: Chelicera (dotted seta present on right chelicera) and galea (enlarged); – 3–4: Pedipalps of female (holotype) and male (paratype); – 5: spermatheca; – 6: genital opercle of female; – 7: walking leg IV; Scale unit 0.1 mm.

low, 2.0–2.2 times longer than broad, femur 5.4–6.3 times, patella 4.3–5.3 times, hand with pedicel 2.8–3.3 times longer than broad and 1.3–1.4 times longer than finger, chela with pedicel 4.8–5.4 times, without pedicel 4.6–5.2 times longer than broad.

Fixed finger with 51–58 small, pointed teeth, accessory teeth laterally 5–6, medially 1 (at base of venom tooth), movable finger with 53–62 small teeth (only in distal 1/3 pointed, the following ones rounded); venom duct in movable finger only, nodus ramosus proximal of *t* (nearer to *t* than to *st)*.



Figs. 8–11. Trichobothrial pattern of adult (8), trito- (9), deuto- (10) and protonymph (11).

Trichobothria (Fig. 8): on fixed finger all but *et/it* in basal half of finger, *isb* (formally *ist*; see Harvey 1994) clearly distal of *est*, but much nearer to *est* than to *it*; *isb* at level of *st*, which is halfway between *sb* and *t* or slightly nearer to the latter one; *et/it* near finger tip, *it* slightly proximal of *et*.

Legs: Leg I: Femur 1.9–2.2 times longer than deep, patella 4.1–4.5 times longer than deep and 1.6–1.9 times longer than femur, tibia 3.8–4.6 times, tarsus 5.1–6.2 times longer than deep and 1.1–1.2 times longer than tibia. Leg IV (Fig. 7): Femur+patella 4.7–5.5 times, tibia (male) 5.5–5.8 resp. (female) 4.5–5.4 times, tarsus 5.8–6.8 times longer than deep; tarsus more or less as long as tibia; a short pseudotactile seta near lateral end of tarsus, length about 0.10–0.11 mm; subterminal seta smooth, curved, claws smooth and longer than undivided arolium.

Measurements in mm (4♂/4♀): Carapace 0.74–0.85/0.70–0.87.

Male: Pedipalps: Trochanter 0.63–0.74/0.23–0.25, femur 1.62–2.16/0.19–0.21, patella 1.49–1.98/0.20–0.23, hand with pedicel 1.13–1.49/0.25–0.29, length of pedicel 0.10–0.13; length of chela with pedicel 1.82–2.22, length of finger 0.72–0.79. Leg I: Femur 0.27–0.31/0.13–0.15, patella 0.50–0.57/0.11–0.12, tibia 0.36–0.41/0.08–0.09, tarsus 0.42–0.44/0.07. Leg IV: Femur+patella 0.70–0.78/0.14–0.16, tibia 0.47–0.52/0.08–0.09, tarsus 0.47–0.50/0.07–0.08.

Female: Pedipalps: Trochanter 0.46–0.51/0.21–0.23, femur 0.94–1.21/0.17–0.19, patella 0.86–1.06/0.19–0.20, hand with pedicel 0.77–0.95/0.27–0.29, length of finger 0.61–0.68, length of chela with pedicel 1.34–1.60, length of pedicel 0.09–0.10. Leg I: Femur 0.26–0.28/0.13, patella 0.44–0.50/0.11–0.12, tibia 0.33–0.36/0.08–0.09, tarsus 0.37–0.42/0.07. Leg IV: Femur+patella 0.65– 0.75/0.13–0.14, tibia 0.43–0.48/0.08–0.10, tarsus 0.45–0.47/0.07–0.08.

Tritonymph (1): Chelicera with 5 setae on palm (one dentate), galea with 5 apical branches. Pedipalps: Femur 4.3 times longer than broad (0.64 mm/0.15 mm) and 1.05 times longer than patella, patella 3.8 times (0.61/0.16), hand with pedicel 2,7 times (0.61/0.22) longer than broad and 1.4 times longer than finger (length 0.43 mm), chela with pedicel 4.5 times longer than broad, length 1.01 mm. Teeth on chelal fingers: 42, 1/1 accessory teeth, movable finger 43, no accessory teeth. Trichobothria see Fig. 9.

Deutonymph (1): Chelicera with 4 smooth setae on palm, galea with 4 apical branches. Pedipalps: Femur 3.6 times longer than broad (0.44 mm/0.12 mm) and 1.07 times longer than patella, patella 3.1 times (0.41/0.13), hand with pedicel 2.6 times longer than broad (0.44/0.17) and 1.2 times longer than finger (length 0.36), chela with pedicel 4.5 times longer than broad, length 0.75 mm. Fixed finger with 31 marginal teeth, no lateral and 1 internal accessory tooth; movable finger with 34 (5 pointed distal ones) teeth, accessory teeth lacking. Trichobothria see Fig. 10.

Protonymph (1): Chelicera with 4 smooth setae on palm, galea with one subapical and two terminal branches. Pedipalps: Femur 3.2 times longer than broad (0.29 mm/0.09 mm) and 1.07 times longer than patella, patella 2.8 times (0.27/0.10), hand with pedicel (0.32/0.13) longer than broad and 1.36 times longer than finger (length 0.23 mm), chela with pedicel 4.1 times longer than broad, length 0.54 mm. Fixed finger with 26, movable finger with 25 marginal teeth, accessory teeth lacking. Trichobothria see Fig. 11.

Remarks: The typical colouration of the adults is recognizable in all nymphal stages, particularly the colour pattern of the chelal hand, and the shape of the chela and its colouration permits the unequivocal identification even of protonymphs of this genus. Apparently, another interesting fact, there is no allometric growth of pedipalpal segments (femur, patella) during postembryological development, since the ratio between femur and patella length does not vary (1.03–1.14 times) within the different stages. Sexually dimorphic differences in length of the chelal hand and finger only occur at adult stages, even trito-nymphs do not indicate "sexual" predispositions.

Biology: The specimens have been collected by canopy fogging, during the aquatic phase in the Pantanal of Poconé, no other specimens could be found with other sampling methods. A special collecting effort during August 2006 at the same place (different mechanical sampling methods) did not yield any new specimen. We therefore know nothing about biology or ecology of this new genus and species, its particular pedipalpal morphology and its considerable size might indicate an association with insects/arthropods and/or the occupation of a particular ecological niche (which one?). The presence of all nymphal stages and adults in the collection indicate a permanent presence on

the palm tree – or the temporary presence of its permanent phoretic host on which postembryological development takes place.

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